

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): An IPATM transmission network that supports multipoint-to-multipoint multi-casting between groups of end points, said network comprising:

a plurality of nodes;

a plurality of endpoints adapted to act as data senders, or receivers, said nodes and endpoints being linked by ATM, ~~said IPATM transmission network adapted to support multipoint-to-multipoint multi-casting between a group of endpoints, characterized in that wherein~~ at least one sender and all receivers, belonging belong to a multi-casting group of endpoints, the at least one sender and all receivers are located on a single spanning delivery tree, and ~~in that~~ only one ~~VC~~ virtual circuit (VC) is employed to transmit data over said single spanning deliver tree, ~~that;~~

a group having members closely located to each other, ~~uses~~ configured to use a multi-cast group address held by an MNS server located close to said group members; and ~~in that~~ ~~an~~

the MNS server located close to said group members is selected by ~~[[;-]]~~ ~~a host~~ requesting ~~its~~ a local MNS server for a new multi-cast group address from a host ~~[[;]]~~, said local MNS server ~~supplying being configured to supply~~ a multi-cast address from its own addresses ~~[[;]]~~, or ~~[[;-]]~~ ~~if said local MNS server has no unused addresses~~, said local MNS server ~~supplying being configured to supply~~ an address for a nearest located other MNS server if said local MNS server has no unused addresses.

Claim 2 (Currently Amended): An IPATM transmission network that supports multipoint-to-multipoint multi-casting between groups of endpoints, said network comprising:

a plurality of nodes;

a plurality of endpoints adapted to act as data senders, or receivers, said nodes and endpoints being linked by ATM, ~~said IPATM transmission network adapted to support multipoint-to-multipoint multi-casting between a group of endpoints, characterised in that~~ said

wherein said IPATM transmission network includes means for building a single spanning delivery tree between at least one sender and all receivers, ~~belonging that belong~~ to a multi-casting group of endpoints, and ~~in that~~ only one [[VC]] virtual circuit (VC) is employed to transmit data over said single spanning delivery tree.

Claim 3 (Currently Amended): An IPATM transmission network, as claimed in claim 1, ~~characterised in that~~ wherein said single spanning delivery tree is a CBT rooted in a core node.

Claim 4 (Currently Amended): An IPATM transmission network, as claimed in claim 3, ~~characterised in that~~ wherein said CBT is built at [[t]] an ATM level.

Claim 5 (Currently Amended): An IPATM transmission network, as claimed in claim 3, ~~characterised in that~~ wherein said IPATM transmission network includes relocation means for relocating the core.

Claim 6 (Currently Amended): An IPATM transmission network, as claimed in claim 1, ~~characterised in that~~ wherein said IPATM transmission network is adapted to have more than one active core, said ~~cores~~ more than one active core being geographically remote from each other.

Claim 7 (Currently Amended): An IPATM transmission network, as claimed in claim 1, ~~characterised in that there is provided~~ further comprising forwarding means ~~adapted to forward~~ for forwarding traffic only to those branches of said single spanning delivery tree where said traffic is required.

Claim 8 (Currently Amended): An IPATM transmission network, as claimed in claim 7, ~~characterised in that~~ wherein operation of said forwarding means does not depend on ~~core~~ a location of a core.

Claim 9 (Currently Amended): An IPATM transmission network, as claimed in claim 3, ~~characterised in that~~ wherein said IPATM transmission network includes MNS means ~~adapted to provide~~ for providing an ATM address for ~~the~~ a core, on receipt of an ~~[[I]]~~ IP multi-cast address.

Claim 10 (Currently Amended): An IPATM transmission network, as claim in claim 9, ~~characterised in that~~ wherein said MNS means is adapted to provide core point management and multi-cast group management.

Claim 11 (Currently Amended): An IPATM transmission network, as claimed in claim 9, ~~characterised in that~~ wherein said MNS means includes a hierarchy of MNS servers.

Claim 12 (Currently Amended): An IPATM transmission network, as claimed in claim 9, ~~characterised in that~~ wherein said IPATM transmission network has only one MNS server, ~~and in that~~ said only one MNS server is responsible for all multi-cast group addresses.

Claim 13 (Currently Amended): An IPATM transmission network, as claimed in claim 1, ~~characterised in that~~ wherein said MNS means includes border routers adapted to translate between protocols thereby enabling said MNS means to co-exist with other multicast protocols.

Claim 14 (Currently Amended): An IPATM transmission network, as claimed in claim 1, ~~characterised in that~~ further comprising means are provided to permit for permitting leaf initiated join.

Claim 15 (Currently Amended): An IPATM transmission network, as claimed in claim 1, ~~characterised in that means are provided to facilitate~~ further comprising means for facilitating an endpoint to switch from functioning as a sender to functioning as a receiver.

Claim 16 (Currently Amended): An IPATM transmission network, as claimed in claim 1, ~~characterised in that means are provided to facilitate~~ further comprising means for facilitating an endpoint to switch from functioning as a receiver to functioning as a sender.

Claim 17 (Currently Amended): An IPATM transmission network, as claimed in claim 1, ~~characterised in that means are provided to enable~~ further comprising means for

enabling a new member to join a group, said means being adapted to cause a join message to be propagated towards a core of said ~~group's core~~ group.

Claim 18 (Currently Amended): An IPATM transmission network, as claimed in claim 1, ~~characterised in that~~ wherein multipoint-to-multipoint connections are provided at the ATM level.

Claim 19 (Currently Amended): An IPATM transmission network, as claimed in claim 1, ~~characterised in that~~ wherein ATM switches in said IPATM transmission network are adapted to behave as store and forward units in the presence of contention, and to behave as cell switches in the absence of contention.

Claim 20 (Currently Amended): An IPATM transmission network, as claimed in claim 1, ~~characterised in that~~ further comprising a VC merging means ~~is provided for~~ preventing interleaving of ATM cells[[],]; ~~and in that~~

a core selection means ~~is provided to optimise~~ for optimising the shape of a structure of a spanning delivery ~~tree's structure~~ tree.

Claim 21 (Currently Amended): ~~In~~ A method of multipoint-to-multipoint multi-casting in an IPATM transmission network comprising a plurality of nodes and a plurality of endpoints adapted to act as data senders, or receivers, said nodes and endpoints being linked by ATM, ~~a method of multipoint to multipoint multi-casting characterised by~~ said method comprising:

building a single spanning delivery tree between at least one sender and all receivers, ~~belonging- that belong~~ to a multi-casting group of endpoints; ~~and by~~

employing only one ~~VC~~ virtual circuit VC to transmit data over said single spanning delivery tree.

Claim 22 (Currently Amended): A method, as claimed in claim ~~1~~ 21, ~~characterised by~~ wherein said single spanning delivery tree ~~being~~ includes a CBT rooted in a core node.

Claim 23 (Currently Amended): A method, as claimed in claim ~~1~~, ~~characterised by~~ 21, further comprising relocating the core to optimise a structure of said spanning delivery ~~tree's structure~~ tree.

Claim 24 (Currently Amended): A method, as claimed in claim 21, further comprising ~~1, characterised by~~ forwarding traffic only to those branches of said single spanning delivery tree where said traffic is required.

Claim 25 (Currently Amended): A method, as claimed in claim 22, further comprising propagating ~~1, characterised by~~ join requests[[,]] from receivers and senders, ~~propagating~~ towards said core.

Claim 26 (Currently Amended): A method, as claimed in claim 22, further comprising ~~1, characterised by~~ said IPATM transmission network including MNS, said MNS providing an ATM address for the core for said MNS, when given an ~~1~~ IP multi-cast address.

Claim 27 (Currently Amended): A method, as claimed in claim 21, further comprising ~~1, characterised by~~ replicating packets only on branches of said spanning delivery tree where they are needed.

Claim 28 (Currently Amended): A method as claimed in claim 26, ~~characterised by~~
further comprising:

[[~~-~~]]configuring a host ~~wishing~~ seeking to use said MNS with an ATM address for a local MNS server;

[[~~-~~]]~~said host, when it wishes to become a member of multi-casting group,~~
transmitting a query to a local MNS server for an address for the core of said multi-casting group from said host when it seeks to become a member of a multi-casting group;

[[~~-~~]]~~said local MNS server, if it is responsible for the group,~~ replying with an ATM address for the core from said local MNS server if it is responsible for the multi-casting group;

[[~~-~~]]~~if said local MNS is not responsible for the group,~~ passing the query between MNS servers; in a MNS hierarchy; until ~~it~~ the query reaches a MNS server which is responsible for said group and said responsible MNS server replying to the querying host if said local MNS server is not responsible for the group;

[[~~-~~]]wherein said MNS hierarchy ~~starting with~~ includes a root MNS server which knows, ~~at the next level,~~ which server at the next level is responsible for which intervals of multi-cast address space; and [[~~-~~]]second level MNS servers ~~knowing~~ are configured to know how an address range they are responsible for is divided into smaller address intervals and which third level MNS server is responsible for which address interval; and

[[~~-~~]]sending queries through the MNS server hierarchy[[~~,~~]] until reaching the MNS server[[~~,~~]] ~~which~~ that holds the tables for the groups for which it is responsible ~~for is reached.~~

Claim 29 (Currently Amended): A method, as claimed in claim 27, ~~characterised by~~
further comprising:

starting every MNS server ~~starting~~ with an empty table[[,]]; and by dynamically creating entries therein.

Claim 30 (Currently Amended): A method, as claimed in claim 7, ~~characterised by realising query passing in two different ways, namely:~~ 28, wherein said transferring the query further comprises:

~~[[-]]if an MNS server is not responsible for a group,~~ passing a query to a root MNS server, which passes it on, ~~or~~ if an MNS server is not responsible for a group; and

~~[[-]]~~passing a query only one level up the MNS hierarchy, and not directly to the root MNS server.

Claim 31 (Currently Amended): A method, as claimed in claim 6, ~~characterised by~~ 26, further comprising

registering the core node for a multi-cast group with the MNS server responsible for the group; and, ~~if a query arrives at MNS server about a group and no core is specified for the group,~~ by

electing the switch that sent the query as the core if a query arrives at the MNS server about a group and no core is specified for the group, and by said switch being able to decline nomination as the core; and, ~~if said switch does not accept nomination as the core,~~ by

not establishing a spanning deliver tree if said switch does not accept nomination as the core.

Claim 32 (Currently Amended): A method, as claimed in claim 5, ~~characterised by a group having members closely located to each other,~~ 26, further comprising:

using a multi-cast group address held by an MNS server located close to ~~said~~ group members, ~~and~~ in a group having members closely located to each other; and

~~by selecting an MNS server located close to said group members by means of the following steps: a host requesting it's a local MNS server for a new multi-cast group address; [[-]] said local MNS server then being responsible for supplying a multicast address from its own addresses; or, and [[-]] if said local MNS server has no unused address, said local MNS server supplying~~ supplying an address for the nearest other MNS server to said local MNS server if said local MNS server has no unused address.

Claim 33 (Currently Amended): A method, as claimed in claim 1, ~~characterised by~~ 21, further comprising causing a join message to be propagated towards a core of said group's ~~core group~~ when a new member ~~indicates a desire~~ seeks to join a group.

Claim 34 (Currently Amended): A method as claimed in claim 1, ~~characterised by~~ 21, further comprising:

transmitting a leave message towards a core of said group over the spanning delivery tree associated with the group ~~towards said group's core~~ when a member of that group ~~indicates a desire~~ seeks to leave the group, ~~by~~ said leave message travelling until it reaches a first junction of said spanning delivery tree; ~~and~~

~~by~~ removing that part of said spanning delivery tree over which said message has travelled.

Claim 35 (Currently Amended): A method, as claimed in claim 21, ~~characterised by~~ group members further comprising periodically sending an "I am alive" message from group members to neighbouring nodes, or endpoints.

Claim 36 (Currently Amended): A telecommunications system, ~~characterised in that~~
wherein said telecommunications system includes an IPATM transmission network as
claimed in claim 1.

Claim 37 (New): An IPATM transmission network that supports multipoint-to-
multipoint multi-casting between groups of endpoints, said network comprising:

a plurality of nodes;

a plurality of endpoints adapted to act as data senders, or receivers, said nodes and
endpoints being linked by ATM,

wherein said IPATM transmission network includes a single spanning delivery tree
building device configured to build a single spanning delivery tree between at least one
sender and all receivers that belong to a multi-casting group of endpoints, and only one
virtual circuit (VC) is employed to transmit data over said single spanning delivery tree.